



IN THE US PATENT AND TRADEMARK OFFICE

January 18, 2008

Inventor : Armin Diez et al.

Title : AT LEAST SUBSTANTIALLY METALLIC CYLINDER HEAD GASKET

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Group: 3673

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Examiner: Lee

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MS Appeal Brief-Patents
Commissioner for Patents
Alexandria, VA 22313-1450

APPELLANT'S AMENDED BRIEF ON APPEAL

Dear Sir:

This is an appeal from the decision of the Examiner dated February 14, 2007, finally rejecting claims 24, 26, and 27.

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REAL PARTY IN INTEREST

The real party in interest is ElringKlinger AG, the assignee of the entire, right, title and interest in the above application.

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RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences known to Applicant or the undersigned which will directly affect, or be affected by or have a bearing on the Board's decision in the appeal.

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STATUS OF CLAIMS

Claims 24, 26, and 27 are pending, are finally rejected, and are the claims on appeal. Claims 1-23 and 25 are canceled. The claims appear in the Claims Appendix.

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STATUS OF AMENDMENTS

A response to the final rejection was filed and was entered by the examiner.

SUMMARY OF CLAIMED SUBJECT MATTER

Applicants' invention as defined by independent claim 24 involves a cylinder head gasket with a gasket plate (see specification page 16, line 14 and reference no. 10 of Figures 1-3) being at least substantially metallic and comprising at least one sheet metal layer (see specification page 1, lines 5-10; page 3, lines 18-27; and page 4, lines 1-5 and reference nos. 12, 200, 200' of Figures 1-3, 17, and 19). The gasket includes several combustion chamber openings (see specification page 16, lines 19-23 and reference nos. 14, 14' of Figures 1-3 and 17 and 19) wherein each of the combustion chamber openings has at least one first bead (see specification page 16, lines 19-23 and reference nos. 20, 20', 202, 202' of Figures 1-3, 17 and 19) associated therewith and being surrounded by the at least one first bead formed in a sheet metal layer of the gasket plate having a spring rate so as to be elastically deformable in height (see specification page 17, lines 1-3) and further having at least one second bead (see specification page 1, lines 5-10; page 9, lines 1-7; page 17, lines 4-16 and reference nos. 210, 210' of Figures 17 and 19) as a delimiting device; namely, a so-called stopper bead (see page 26, lines 11-12 and page 28, lines 4-6 and reference nos. 210, 210' of Figures 17 and 19), associated with each of the first beads for delimiting the elastic deformation of the associated first bead (see specification page 1, lines 5-10 and page 17, lines 4-16). To this end, the at least one second bead (stopper bead) (reference nos. 210, 210') is disposed close to the respective first bead (reference nos. 202, 202' of Figures 17 and 19), surrounding the respective combustion chamber opening (reference nos. 14, 14') and being obtained by deformation of a sheet metal layer of the gasket plate such that the at least one second bead (stopper bead) (reference nos. 210, 210') of the deformed sheet metal layer comprises the features set forth in paragraphs (a) through (e) of claim 24.

Namely, the at least one second bead (stopper bead) (reference nos. 210, 210' of Figures 17 and 19) has features of:

- (a), in a plan view of the deformed sheet metal layer (reference nos. 200, 200' of Figure 17 and 19), surrounds the associated combustion chamber opening (reference nos. 14, 14' of Figures 17 and 19) substantially completely and forming over at least part of the length of the second bead a substantially complete meander (reference nos. 210, 210' of Figures 17 and 19) extending in a circumferential direction of the combustion chamber opening (see specification page 9, lines 1-7; page 26, lines 7-24; page 28, lines 4-8 and reference nos. 210, 210' of Figures 17 and 19);
- (b) all around the respective combustion chamber opening (reference nos. 14, 14' of Figures 17 and 19) the spring rate of the second bead (stopper bead) is greater than the spring rate of the associated first bead when measured perpendicularly to the gasket plate (see specification page 5, line 24 through page 6, line 2 and respective reference nos. 210, 210' and 202, 202' of Figures 17 and 19);
- (c) in plan view of said gasket plate (reference no. 10 of Figures 1-3), the second bead (stopper bead) (reference nos. 210, 210' of Figures 17 and 19) is disposed between the associated combustion chamber opening and the associated first bead (see specification page 9, lines 7-13; page 13, lines 23-25; page 26, lines 7-24 and respective reference nos. 14, 14' and 202, 202' of Figures 17 and 19);

(d) the height of the second bead (stopper bead) (reference nos. 210, 210' of Figures 17 and 19) is selected so as to allow an elastic deformation of the associated first bead (see specification page 5, lines 18-24; page 18, lines 5-10; and reference no. 202 of Figure 17);

(e) in a plan view of the deformed sheet metal layer the total area occupied by the second bead (stopper bead) (area of reference no. 210 of Figure 17) is at least equal to half of the total area occupied by said delimiting device (see specification page 26, lines 15-24 and area between lines 206 and 208 of Figure 17).

Claim 26 depends from claim 24 and recites that the second bead (stopper bead) (reference nos. 210, 210' of Figures 17 and 19) is obtained by such a deformation of the deformed sheet metal layer (see specification page 4, lines 1-5 and reference nos. 12, 200, 200' of Figures 1-3, 17, and 19) that a thickness of material of a portion of the layer forming the second bead (see thickness of reference no. 22 of Figure 3 and thickness of reference no. 210 of Figure 17) is substantially the same as a thickness of material of the deformed layer adjacent the second bead (see reference letter D of Figure 3 and thickness of reference no. 200 of Figure 17).

Claim 27 depends from claim 24 and recites that the height of the second bead (stopper bead) (see height reference letter A of Figure 3 and height of reference no. 210 of Figure 17) is selected such that when the gasket is tightened, the first bead is initially compressed without compression of the second bead (see specification page 5, lines 18-24 and respective reference nos. 20 and 22 of Figure 3 and respective reference nos. 202 and 210 of Figure 17).

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GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

FIRST ISSUE

The first issue presented for review is whether the subject matter of claims 24, 26, and 27 is obvious under 35 USC 103(a) in view of the Miyaoh US Patent 5,961,126 taken with the Ishikawa et al. US Patent 5,427,389.

ARGUMENT

FIRST ISSUE:

The rejection of claims 24, 26, and 27 as obvious under 35 USC 103(a) in view of the Miyaoh US Patent 5,961,126 taken with the Ishikawa et al. US Patent 5,427,389 is in error.

Firstly, the examiner is believed to misinterpret the cited Miyaoh '126 patent in order to provide support for a prohibited hindsight analysis of the claimed invention. In particular, the examiner argues that in the cylinder head gasket of the '126 patent, the beads A12a surrounding the combustion chamber openings Hc form stoppers for the peripheral bead A16. The examiner's characterization of the beads A12a as stoppers is patently incorrect and not supported by the disclosure of the '126 patent itself.

For example, contrary to the examiner's argument, the '126 patent itself expressly discloses that the beads A12a are sealing beads disposed around each of the combustion chamber bores Hc and compressed to seal around the cylinder bore when the gasket is placed between the cylinder head and the cylinder block and the cylinder head screws are tightened. For example, the beads A12a are described column 3, lines 40-41 and lines 54-58 of the '126 patent. This is apparent from Figures 2 and 3, where Figure 2 is taken along lines 2-2 of Figure 1, while Figure 3 is taken along lines 3-3 of Figure 1.

Secondly, Applicants note that when the cylinder head gasket is mounted and clamped between a cylinder head and an engine block, the pressing forces acting on the cylinder head gasket are produced by the cylinder screws, which extend through the bolt holes Hb shown in Figure 1 of the '126 patent. Further, Applicants note that a cylinder head cannot be considered as an absolutely stiff and rigid component. As a result, the pressing forces created by the cylinder head screws which extend through bolt hole Hb are highest at the locations of the cylinder head screws; i.e., the bolt holes Hb, and decrease with increasing distance (in a plan view of the gasket) from the bolt holes Hb. In the gasket of the '126 patent, the bolt holes Hb are positioned between the peripheral bead A16 and the beads A12a. For this reason, one skilled in the art of cylinder head gaskets would never consider that the beads A12a could serve as stoppers for the peripheral bead A16 which, particularly along the upper longitudinal edge of the gasket shown in Figure 1, is positioned remote from the beads A12a and with the bolt holes Hb between the peripheral bead A16 and the beads A12a.

Thirdly, a review of Figures 2 and 3 of the '126 patent indicates that when the gasket is pressed, the beads A12a cannot prevent the peripheral bead A16 from being completely flattened. The beads A12a cannot be considered to be a stopper, which has the function of preventing an associated sealing bead from being completely flattened.

The examiner thus is incorrect that beads A12a constitute a delimiting device of the type recited in Applicants' claim 24 and his argument is contrary to the teachings of the '126 patent itself (see column 3, lines 40-41 and lines 54-58).

Fourthly, the gasket of the '126 patent does not provide stoppers for the combustion chamber opening beads A12a, and the peripheral beads A15 and A16 are unable to protect the first combustion chamber opening beads A12a against excessive flattening because the peripheral beads A15, A16 do not surround each single one of the combustion chamber openings.

As mentioned above, the '126 patent itself (column 3, lines 40-41 and lines 54-58) expressly discloses that the beads A12a are sealing beads disposed around each of the combustion chamber bores Hc and compressed to seal around the cylinder bore when the gasket is placed between the cylinder head and the cylinder block and the cylinder head screws are tightened as is apparent from Figures 2 and 3. The gasket of the '126 patent simply does not provide stoppers for the combustion chamber opening beads A12a.

The examiner's arguments concerning the Miyaoh '126 patent in support of a prohibited hindsight analysis of the claimed invention thus are patently incorrect and violate the analysis principles set forth in Graham V. Deere.

Fifthly, the examiner also is believed to be incorrect in stating on page 2, paragraph 1 of the final rejection that the '126 patent discloses a gasket plate comprising at least one sheet metal layer (A12) and having several combustion chamber openings (Hc), each of said combustion chamber openings being surrounded by at least one first bead (A16)". Applicants note that the single peripheral bead A16 encloses the entire group of all combustion chamber openings Hc.

There is no disclosure or suggestion in the '126 patent of a gasket wherein each of the combustion chamber openings has at least one first bead associated therewith and being surrounded by the at least one first bead and further having at least one second bead (stopper bead) as a delimiting device associated with each of the first beads for delimiting the elastic deformation of the associated first bead wherein the at least one second bead (stopper bead) is disposed close to the respective first bead and surrounding the respective combustion chamber opening as set forth in claim 24.

The examiner again appears to misinterpret the cited Miyaoh '126 patent to support a prohibited hindsight analysis of the claimed invention in a manner contrary to the disclosure of the patent itself and to the analysis principles set forth in Graham V. Deere.

Sixthly, the examiner also is believed to be patently incorrect in his comments appearing at the bottom of page 2 and top of page 3 of the final rejection with respect to features set forth in paragraphs (a), (b), (c), (d) and (e) of claim 24, given that the examiner misinterprets the bead A12a as a stopper bead contrary to the express disclosure of the '126 patent (see column 3, lines 40-41 and lines 54-58). As noted above, the bead A12a is not a stopper bead, but rather is a sealing bead.

In addition to the above-discussed deficiencies of the Miyaoh '126 patent, the examiner recognizes on page 3, fifth paragraph of the final rejection that the '126 patent does not disclose the features set forth in paragraph (a) of claim 24; namely; that in a plan view of the deformed sheet metal layer, the at least one second bead (stopper bead) surrounds the associated combustion chamber opening substantially completely and forming over at least part of the length of the second bead a substantially complete meander extending in a circumferential direction of the combustion chamber opening.

The examiner cites the secondary Ishikawa '389 patent as disclosing that a bead can be made to meander in a plan view.

However, Applicants do not believe that one skilled in the art of cylinder head gaskets has any reason for combining the '126 patent and the '389 patent as the examiner does, because the meandering beads shown in Figures 5 and 6 of the '389 patent serve exclusively the purpose of supporting part of the tightening pressure (applied by the cylinder head screws) in the zones close to the narrow edges of the cylinder head gasket where

the cylinder head has the tendency to be drawn (by the cylinder head screws) closest to the engine block and thus to reduce deformation of the cylinder head, not the sealing bead 12a of the gasket. The proposed combination of the '126 patent and the '389 patent appears to Applicants to constitute a prohibited hindsight-on-hindsight analysis of the claimed invention.

The only reasonable combination of the cited reference patents that is suggested by the cited patents themselves would occur in such manner that the peripheral bead A16 of the gasket of the Miyaoh '126 patent has meandering sections in the neighborhood of the two narrow edges of the gasket shown in Figure 1 of the '389 patent in order to make the bead A16 more stiff in these narrow edge zones. However, this combination of the cited patents does not yield Applicants' claim 24.

Applicants believe that the '126 patent and the '389 patent alone and combined together fail to disclose or suggest the cylinder head gasket recited in Applicants' claims 24, 26, and 27.

With respect to claim 26 that depends from claim 24, the Miyaoh '126 patent does not disclose at least one second bead (stopper bead) associated with the sealing bead A12a of each combustion chamber opening Hc. The '389 patent adds nothing to the '126 patent to make up for this deficiency. Thus, the cited patents do not suggest the features of claim 26 relating to the second bead (stopper bead).

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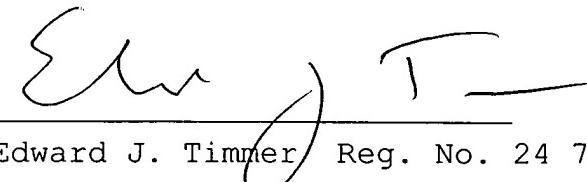
With respect to claim 27 that depends from claim 24, the Miyaoh '126 patent does not disclose at least one second bead (stopper bead) associated with the sealing bead A12a of each combustion chamber opening Hc. The '389 patent adds nothing to the '126 patent to make up for this deficiency. Thus, the cited patents do not suggest the features of claim 27 relating to the height of the second bead (stopper bead).

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CONCLUSION

It is respectfully submitted that pending claims 24, 26, and 27 are not obvious under 35 USC 103(a) in view of the Miyaoh US Patent 5,961,126 taken with the Ishikawa et al. US Patent 5,427,389.

Respectfully submitted,


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Encl. Claims Appendix, Evidence Appendix. Related Proceedings
Appendix

CLAIMS APPENDIX

1-23. (canceled)

24. (previously presented) A cylinder head gasket with a gasket plate being at least substantially metallic, said gasket plate comprising at least one sheet metal layer and having several combustion chamber openings, each of said combustion chamber openings having at least one first bead associated therewith and being surrounded by said at least one first bead formed in a sheet metal layer of said gasket plate and having a spring rate so as to be elastically deformable in height, wherein for delimiting the elastic deformation of said first bead at least one delimiting device is associated with each of said first beads, said delimiting device being close to the respective first bead, surrounding the respective combustion chamber opening and being obtained by deformation of a sheet metal layer of said gasket plate such that

(a) said delimiting device is formed by at least one second bead of said deformed sheet metal layer, said second bead having a spring rate and, in a plan view of said deformed sheet metal layer, surrounding the associated combustion chamber opening substantially completely and forming over at least part of the length of said second bead a substantially complete meander extending in a circumferential direction of said combustion chamber opening;

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- (b) all around the respective combustion chamber opening the spring rate of the second bead is greater than the spring rate of the associated first bead when measured perpendicularly to said gasket plate;
- (c) in plan view of said gasket plate, the second bead is disposed between the associated combustion chamber opening and the associated first bead;
- (d) the height of the second bead is selected so as to allow an elastic deformation of the associated first bead; and
- (e) in a plan view of the deformed sheet metal layer the total area occupied by the second bead is at least equal to half of the total area occupied by said delimiting device.

25. (canceled)

26. (previously presented) The cylinder head gasket of claim 24 wherein the second bead is obtained by such a deformation of said deformed sheet metal layer that a thickness of material of a portion of said layer forming the second bead is substantially the same as a thickness of material of the deformed layer adjacent said second bead.

27. (previously presented) The cylinder head gasket of claim 24 wherein the height of the second bead is selected such that when the gasket is tightened, the first bead is initially compressed without compression of the second bead.

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EVIDENCE APPENDIX

None

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RELATED PROCEEDINGS APPENDIX

None